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KLINKMAN, John, Edward [US/US]; 29371 Maurice Court, Chesterfield Township, MI 48047 (US). MANN, Richard, Aaron [US/US]; 410 N. Gainsborough, Royal Oak, MI 48067 (US).

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(74) Agents: COPPOLA, Joseph, V., Sr. et al.; Rader, Fishman and Grauer PLLC, Suite 140, 39533 Woodward Avenue, Bloomfield Hills, MI 48304 (US).

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(71) Applicant: SPORTRACK LLC [US/US]; Suite 200, 12900 Hall Road, Sterling Heights, MI 48313 (US).

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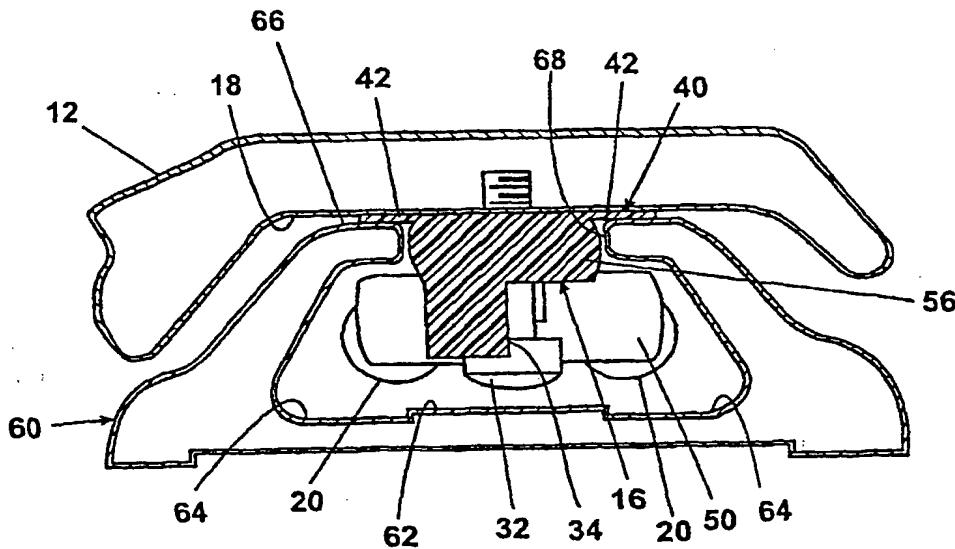
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(71) Applicants and

(72) Inventors: CRONCE, Gary, M. [US/US]; 1312 23rd Street, Port Huron, MI 48060 (US). OSBORN, Matthew [US/US]; 22030 Alger Street, St. Clair Shores, MI 48080 (US). OBERMESIK, Terry, Lee [US/US]; 3544 10th Avenue, Port Huron, MI 48060 (US). BORGHI, Richard,

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ARTICLE CARRIER STANCHION GLIDE



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(57) **Abstract:** A stanchion glide is disclosed that provides a bearing surface on both a bottom interior surface (62) and a top exterior surface (66) of an article carrier side rail (60). The stanchion glide includes a body (24) member defining upper and lower surfaces sized to be received within a side rail of an article carrier. A first bearing finger (34) extends from the lower surface, while a second elongated bearing surface is attached to the upper surface. Preferably, the second bearing surface comprises a set of laterally extending wings (42) adjacent the upper surface, wherein the upper face of the wings is coextensive with the body upper surface. The wings may be angled slightly upwardly away from the body upper surface for resilient contact with a bottom surface of the stanchion.

## ARTICLE CARRIER STANCHION GLIDE

### Field Of The Invention

5 The present invention relates to an article carrier assembly for a vehicle roof, and more particularly to an article carrier stanchion bearing surface with improved noise damping and slideability features.

### Background of the Invention

10 Every year, significant money is spent to enhance vehicle operation and styling. Often times, the success of a vehicle is due in a large part to the aesthetic appeal of the vehicle and the operability of vehicle components such as article carriers.

Automotive designers have reduced noise due to rattle or squeaks in many vehicle components. However, automotive accessories such as roof mounted article carrier assemblies remain a potential source of undesirable vehicle noise. Such article carriers typically include a pair of side rails mounted to the roof with at least one cross rail extending therebetween. Stanchions on opposing ends of the cross rail attach the cross rail to the side rails. The stanchions are usually secured to the cross rails by way of clamps or similar securing mechanisms. When installed, the clamps generally include clearance tolerances between the securing mechanisms and the side rail. Even if the tolerances are small, the securing mechanisms may become worn and loosen with time. In each situation, the article carrier may produce significant unwanted noise during vehicle operation due to gaps between the securing mechanisms and the side rails.

Additionally, vehicle designers continue to develop consumer friendly features, especially for article carrier assemblies. In particular, designers seek to improve the ease

with which cross rails may be relocated, including facilitating relocation of cross rails from only one side of a vehicle by a single user.

One accepted design uses an extruded aluminum side rail in combination with aluminum die-cast stanchions. The stanchions include cast stanchion cars that are received 5 within the side rails. The stanchion cars double as clamping devices, and may be compressed against the bottom interior surface of the side rails by actuation of a spring-loaded clamp. Each stanchion further includes two stanchion glides attached to the forward and rearward ends of the stanchion cars that provide a bearing surface against the bottom interior surface of the side rails when the stanchion cars are not compressed against the side rails. However, 10 during sliding movement of the stanchion along the side rails, a lower surface of the stanchion rides upon parallel upper surfaces of the side rails. Due to manufacturing methods, the lower surface of the stanchion may include sharp edges or "flash lines" that frictionally interact with the top surface of the guide rails. In particular, the flash lines scrape against the painted surface, both removing paint and gouging the extruded aluminum side rails, resulting 15 in ever increasing effort to relocate the stanchions, as well as undesirably damaging both the cosmetic finish and operational surface of the side rails. As the gouging occurs over time, operational functionality of the article carrier is decreased. Additionally, wear of the side rails and mating stanchion components leads to forward and rearward rocking of the stanchion within the side rail, leading to undesirable noise and rattle of the stanchion even 20 when it is locked in place within the side rail.

#### Summary Of The Invention

The present invention overcomes the operational and aesthetic disadvantages noted above by providing a stanchion glide that provides an improved bearing surface on both a 25 bottom interior surface and a top exterior surface of an article carrier side rail. The improved

stanchion glide of the present invention provides a larger area of contact between a bottom surface of a stanchion as compared to prior art designs while tightening the tolerances between the stanchion and the side rail to eliminate unwanted squeaks or rattles.

The stanchion glide of the present invention includes a non-metallic body member defining upper and lower surfaces sized to be received within a side rail of an article carrier. A first bearing finger extends from the lower surface, while a second bearing surface is attached to the upper surface. Preferably, the second bearing surface comprises a set of laterally extending wings adjacent the upper surface, wherein the upper face of the wings is coextensive with the body uppersurface. The wings may be angled slightly upwardly away from the body upper surface for resilient contact with a bottom surface of the stanchion.

#### Brief Description Of The Drawings

The features and inventive aspects of the present invention will become more apparent upon reading the following detailed description, claims, and drawings, of which the following is a brief description:

FIG. 1 is an environmental view showing the stanchion glide according to the present invention attached to a stanchion.

FIG. 2 is an inverted side perspective view of the stanchion glide of the present invention.

FIG. 3 is a top perspective view of the stanchion glide of the present invention.

FIG. 4 is a cross-sectional view of the stanchion glide of the present invention inserted within a side rail.

Detailed Description Of Preferred Embodiment

A stanchion assembly 10 according to the present invention is shown in FIG. 1. The stanchion assembly 10 includes a stanchion 12, a stanchion car 14, and two stanchion glides 16. The stanchion car 14 and the stanchion glides 16 are attached to the stanchion bottom surface 18 according to methods known in the art. The stanchion 12 and the stanchion car 14 are both preferably formed of cast aluminum. When assembled to an extruded aluminum side rail 60 (shown in FIG. 4), the stanchion car 14 is slidably received within the side rail 60 such that the bottom of the stanchion car 20 contacts a bottom interior surface 62 of the side rail 60. In FIG. 1, the stanchion car 14 includes two generally cylindrical sections 22 that serve to locate the car 14 within the side rail 60. Moreover, the stanchion car 14 also serves as a clamping device, and may be compressed against one or more interior surfaces 64 of the side rail 60 by actuation of a spring-loaded clamp (not shown).

When the stanchion car 14 is not compressed against an interior surface 64 of the side rail 60, sliding movement of the stanchion 12, including the stanchion car 14, is enabled by the presence of at least one improved stanchion glide 16, seen more clearly in FIGs. 2, 3 and 4. The glide 16 includes a body 24 that defines a lower surface 26 and an upper surface 28. Preferably, the body 24 also includes an aperture 30 therethrough for receiving an attachment screw 32 or similar fitting to attach the glide 16 to the stanchion bottom wall 18.

A first bearing finger 34 extends from the glide lower surface 26. Optimally, when the stanchion car 14 is not compressed against an interior surface of the side rail, bearing finger 34 may contact the interior bottom surface 62 of the side rail 60. However, the stanchion lower surface 18 slideably contacts an exterior upper surface 66 of the side rail 60. Further, even when the stanchion 12 is locked in place, the stanchion 12 is susceptible to fore and aft rocking and rattle between the side rail exterior upper surface 66 and the stanchion lower surface 18.

In the prior art stanchion assemblies, the sliding interaction between the stanchion lower surface 18 and the side rail exterior upper surface 66 results in metal-to-metal interaction and locally high friction. In particular, production casting of the stanchion 12 results in a contoured lower wall 18 that includes flash lines 36 (see FIG. 1). The flash lines 36 are generally formed as ridges due to the manufacturing process. In the worst case, the flash lines 36 are oriented transverse to the side rail, and also transverse to sliding movement of the stanchion assembly. As may be appreciated, as the stanchion 12 is slideably moved in the direction indicated by arrow 38, the flash lines 36 frictionally interact with the side rail exterior upper surface 66. Specifically, the flash lines represent sharp edges that may scrape against the painted side rail exterior upper surface 66. The scraping action tends to remove paint from the side rail, damaging the cosmetic finish. Moreover, extended movement of the stanchion assembly 10 may permanently gouge the extruded aluminum side rails 60, resulting in much higher friction between the side rail 60 and the stanchion lower surface 18, thereby requiring ever-increasing effort to relocate the stanchions.

To prevent the undesirable high friction between the stanchion lower surface 18 and the side rail, the present invention provides for a thin layer 40 of non-metallic bearing material to be interposed between the stanchion lower surface 18 and the side rail exterior upper surface 66. The bearing material layer 40 may comprise an elongated shim attached to the upper surface 28 of the body. However, the bearing material layer 40 is most preferably provided as a set of laterally extending wings 42 integrally formed with the body 24. The wings 42 are formed from the same material as the glide. It has been found that an acetal material having a low coefficient of friction provides a desirable bearing surface, while also greatly improving the ease with which the stanchion 12 slideably moves along the side rail.

When formed with the glide 16, an upper face 43 of the wings 42 is coextensive with the upper surface 28 of the body 24, and when installed, is in facing contact with the

stanchion lower surface 18. To prevent curling of the wings 42 toward the body 16 during formation of the wings, the wings 42 may be angled upwardly slightly to form a resilient angle  $\alpha$  with respect to the upper surface 28. If the wings 42 are allowed to curl toward the body 16, installation of the stanchion 12 within a side rail may damage the wings 42, and 5 may possibly detach the wings from the body either during installation or during movement of the stanchion 12 within the side rail. In particular, it has been found that an angle of between one and ten degrees is sufficient to prevent curling and binding, with an optimal angle of two degrees utilized. Additionally, the thickness of the wings may be adjusted to accommodate larger or smaller flash lines 36. In particular, the thickness  $T$  of the wings 42 10 may be adjusted to take up any "play" between the stanchion 12 and the side rail to prevent fore and aft rocking and rattle of the stanchion 12. Preferably, the thickness  $T$  of the wings 42 is slightly larger than the height of the flash lines 36. It has been found that a wing thickness  $T$  of between 0.25 and 0.75 mm provides a sufficiently thick bearing surface without causing binding between the stanchion 12 and the side rail. Moreover, a wing thickness  $T$  of about 15 0.5 mm also provides sufficient thickness to maintain the stanchion 12 in constant contact with the side rail, thereby eliminating rattle and noise.

The glide of the present invention is also formed with a latching flange 44 at a first end 46 of the body 24. The latching flange 44 works in conjunction with tabs 48 along the first end 46 to engage the car 14 and maintain alignment of the body 24 within the side rail. 20 Optionally, a mounting tee 50 may be formed on each lateral edge 52 of the car 14 to receive the flange 44, thereby maintaining alignment of the glide 16. Finally, to minimize the amount of glide lateral movement, the glide side walls 54 directly above the wings 42 project outwardly to selectively contact the side rail. It is important that the amount of contact be controlled to minimize potential binding within the side rail as the stanchion 12 is moved 25 back and forth. For example, as seen in FIGs. 3 and 4, the outward projections 56 are

generally arcuate in shape to fix the position of the glide 16 laterally with respect to the side rail 60 and to control the lateral contact surface area between the glide 16 and the interior upper portion 68 (FIG. 4).

The glide of the present invention therefore includes a shim 40 that both tightens 5 tolerances between the stanchion 12 and the side rail and allows the stanchion 12 to slide easily along the side rail. In the most preferred embodiment, the shim 40 is included on the glide 16 as a set of integrally formed wings 42. The wings 42 provide a bearing surface between the stanchion 12 and the side rail, thereby minimizing frictional interaction due to the flash lines formed in the stanchion lower surface. As a result, the stanchion and cross rail 10 may be adjustably positioned without ever-increasing effort, and cosmetic damage to the side rail is entirely avoided. Moreover, the shim height is designed to reduce the fore and aft rocking action of the stanchion 12, thereby reducing noise and rattle of the rack.

By forming the shim 40 or the wings 42 out of acetal material, friction between the stanchion 12 and the side rail is greatly reduced. Further, the acetal material may be used to 15 form the glide 16 to include arcuate projections 56 in the glide side walls 54 to selectively contact the side rail and to minimize potential binding within the side rail as the stanchion 12 is moved back and forth.

Preferred embodiments of the present invention have been disclosed. A person of ordinary skill in the art would realize, however, that certain modifications would come within 20 the teachings of this invention. Therefore, the following claims should be studied to determine the true scope and content of the invention.

CLAIMS

What is claimed is:

1. A stanchion glide for mounting between an article carrier stanchion and a side rail, comprising:

5 a body member, said body member defining upper and lower surfaces; at least one elongated shim attached to said body adjacent said upper surface to promote slideability of the stanchion along the side rail, said at least one shim comprising a set of laterally extending wings integrally formed on said body; wherein an upper surface of said wings is generally coextensive with said body upper 10 surface; and wherein said wings are angled upwardly with respect to said body upper surface.

2. The glide of claim 1, wherein said wings are upwardly angled between approximately one and ten degrees from the body upper surface.

3. The glide of claim 2, wherein said wings are upwardly angled approximately two degrees from the body upper surface.

4. The glide of claim 1, wherein said body further includes a latching flange adapted to engage a car in order to maintain alignment of said body relative to the side rail.

5. The glide of claim 4, wherein said body includes outwardly projecting side walls to reduce lateral movement of said body relative to the side rail.

6. The glide of claim 1, wherein said body is adapted to be attached to the article carrier stanchion.

7. In an article carrier having at least one side rail in combination with at least one stanchion, the stanchion including a stanchion car extending from a lower surface of the stanchion, the stanchion car being received within the side rail and capable of being compressed against a bottom interior surface of the side rail by actuation of a clamp

5 mechanism, a stanchion glide comprising:

a body member having opposed upper and lower surfaces and opposed sides; at least one elongated shim attached to said body adjacent said upper surface, said shim interposed between the stanchion lower surface and the side rail to promote slideability of the stanchion along the side rail, said at least one shim comprising a set of laterally

10 extending wings integrally formed on said body;

wherein an upper surface of said wings is generally coextensive with said body upper surface; and

wherein said wings are angled upwardly with respect to said body upper surface.

8. The stanchion glide of claim 7, wherein said body member is non-metallic.

9. The stanchion glide of claim 8, wherein said body member is formed of an acetal material.

10. The stanchion glide of claim 7, wherein said wings are upwardly angled between approximately one and ten degrees from the body upper surface.

11. The stanchion glide of claim 10, wherein said wings are upwardly angled approximately two degrees from the body upper surface.

12. The stanchion glide of claim 7, wherein said body further includes a latching flange adapted to engage a car in order to maintain alignment of said body relative to the side rail.

13. The stanchion glide of claim 12, wherein said body includes outwardly projecting side walls to reduce lateral movement of said body relative to the side rail.

14. The stanchion glide of claim 7, wherein said body is adapted to be attached to the article carrier stanchion.

15. An article carrier comprising:

at least one side rail;

at least one stanchion slideably mounted to said side rail, a bottom surface of said side rail including at least one ridge;

5 a stanchion glide including a shim interposed between said stanchion bottom surface and said side rail to provide clearance therebetween and to promote slideability of said stanchion on said side rail, said shim comprising a set of laterally extending wings integrally formed on said glide, an upper surface of said wings generally coextensive with said glide upper surface; and

10 wherein said wings are angled upwardly with respect to said glide upper surface.

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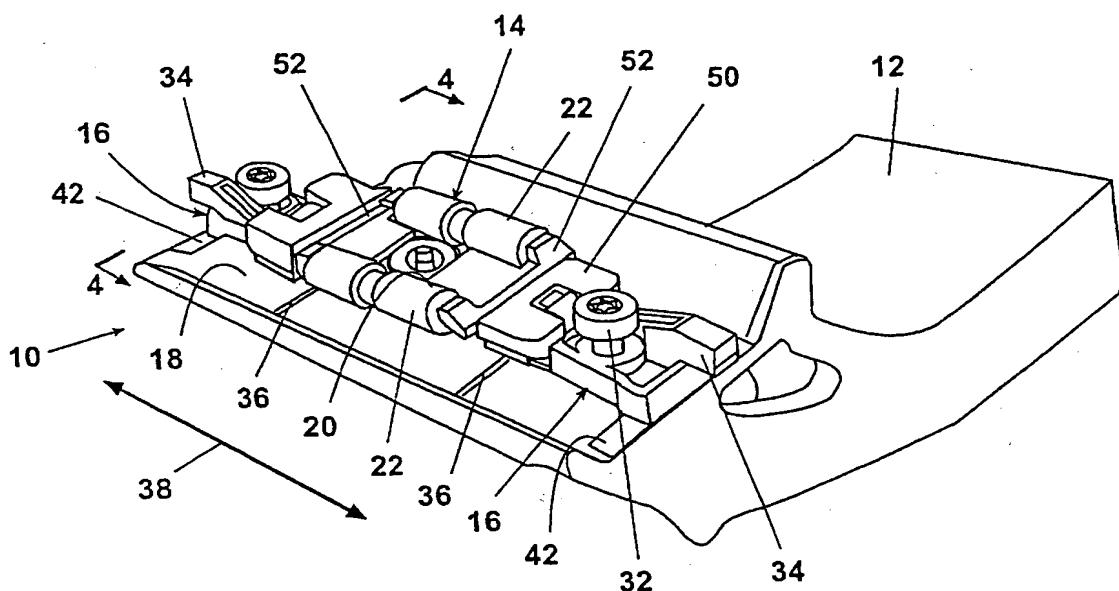


Fig. 1

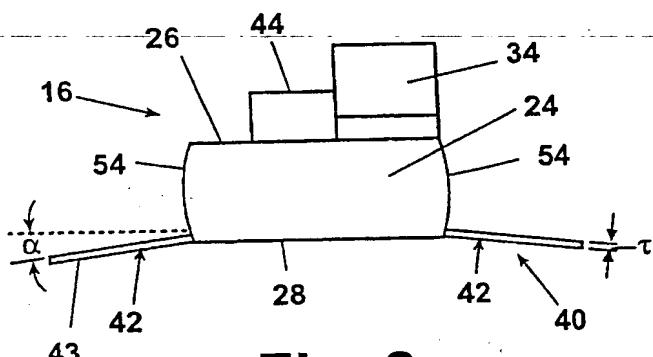


Fig. 2

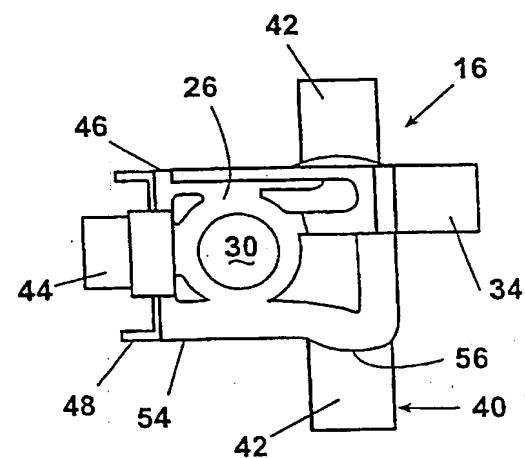


Fig. 3

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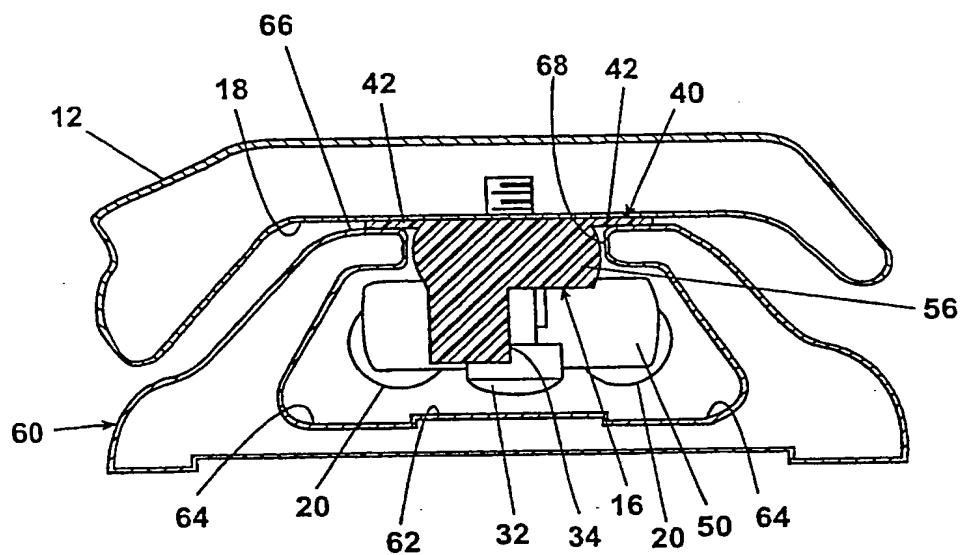


Fig. 4

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 01/03159

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 B60R9/045

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 98 39177 A (ADVANCED ACCESSORY SYSTEMS) 11 September 1998 (1998-09-11) figure 5	1,7,15
A	US 4 988 026 A (RASOR) 29 January 1991 (1991-01-29) column 3, line 53-64	1,7,15



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*g\* document member of the same patent family

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Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.  
Fax: (+31-70) 340-3016

Authorized officer

Knops, J

**INTERNATIONAL SEARCH REPORT**

## Information on patent family members

International Application No

PCT/US 01/03159

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9839177 A	11-09-1998	US 6050466 A AU 6536998 A	18-04-2000 22-09-1998
US 4988026 A	29-01-1991	NONE	

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